PATENT
ATTORNEY DOCKET NO.: 049128-5006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	)	
Joo Soo LIM et al.	)	Confirmation No.: 2174
	)	
Application No.: 09/840,082	)	Group Art Unit: 2871
	)	
Filed: April 24, 2001	)	Examiner: Qi, Zhi Qiang
	)	
For: Liquid Crystal Display Device and Fabricating Method Thereof	)	**Mail Stop Appeal Brief Patents**
	)	

Commissioner for Patents
Mail Stop Appeal Brief Patents
Alexandria, VA 22314

Sir:

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

This brief is in furtherance of the Notice of Appeal, filed in the above-identified patent application on July 7, 2005. A fee of $500.00 required under 37 C.F.R. §41.20(b)(2) is being filed concurrently herewith. The period for filing this brief having been extended through October 7, 2005, by a Petition for Extension of Time and fee payment authorization filed concurrently herewith.

1. The Real Party in Interest

The real party in interest in this appeal is LG.Philips LCD Co., Ltd. of Seoul, Korea.

2. Related Appeals and Interferences

Appellants are not aware of any other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal.

3. Status of Claims

The status of the claims is as follows upon filing of this Appeal Brief:

Claims canceled: 4, 8, 10, 14, 18, and 20.
Claims withdrawn from consideration but not canceled: None
Claims pending: 1-3, 5-7, 9, 11-13, 15-17, 19, and 21.
Claims objected to: None
Claims allowed: None
Claims rejected: 1-3, 5-7, 9, 11-13, 15-17, 19, and 21.

The claims on appeal are 1-3, 5-7, 9, 11-13, 15-17, 19, and 21.

4. The Status of Amendments

Appellants have filed an Amendment under 37 C.F.R. § 1.116 concurrently herewith merely to correct informalities identified during preparation of this brief, thereby placing the claims in better form for appeal. The claim amendments provided in the concurrently filed

Amendment under 37 C.F.R. § 1.116 do not alter the scope of the claims. As such, Appellants submit this brief in the understanding that the claim amendments will be entered. Moreover, the claims provided in the claims appendix herein include the claim amendments of the Amendment under 37 C.F.R. § 1.116.

5. Summary of Claimed Subject Matter

Aspects of Appellants' present invention relate generally to a liquid crystal display device and a method of fabricating a liquid crystal display device. The present invention, as summarized below, is described in detail at paragraphs [0024]-[0030] of the specification with reference to Figures 4-6.

In accordance with the exemplary embodiment of the invention of independent claim 1 and as shown in the exemplary illustration of Figures 4-5, a liquid crystal display device comprises a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33; a switching device 32 at an intersection between the gate line 34 and the data line 33, the switching device 32 includes a light-shielding member 31 overlapping the switching device 32 and extending from an end at the pixel electrode side of a metal thin film 27 provided within the switching device 32 into the pixel area, the light shielding member 31 covering and extending past all sides of the metal thin film 27 with a margin sufficient to block light incident on the metal thin film 27, wherein the switching device 32 is a thin film transistor at the intersection between the gate line 34 and the data line 33 for driving the pixel electrode 30, and wherein the metal thin film 27 of the switching device 32 is a drain electrode connected to the pixel electrode 30.

In accordance with the exemplary embodiment of the invention of independent claim 5 and as shown in the exemplary illustration of Figures 4 and 6, a liquid crystal display device comprises a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33; a charging device 39 on the gate line 34, the charging device 39 including a metal thin film, wherein the charging device 39 is a storage capacitor having an upper electrode 35 formed with the gate line 34; and a dielectric layer between the upper electrode 35 and the gate line 34 (wherein the metal thin film recited in independent claim 5 serves as the upper electrode 35); a light-shielding member 31 overlapping the charging device 39 and extending from an end at the pixel electrode side of the metal thin film 35 into the pixel area with a margin sufficient to block light incident on the metal thin film 35.

In accordance with the exemplary embodiment of the invention of independent claim 9 and as shown in the exemplary illustration of Figures 4-6, a liquid crystal display device comprises a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33; a thin film transistor 32 at an intersection between the gate line 34 and the data line 33 and including a first metal thin film 27, wherein the first metal thin film 27 is a drain electrode connected to the pixel electrode 30; a storage capacitor 39 on the gate line 34 and including a second metal thin film 35, wherein the second metal thin film 35 is an upper electrode over the gate line 34 and a dielectric layer; a black matrix 31 at a boundary portion between pixel areas; a first dummy black matrix 31a connected to the black matrix 31 and extending from an end at the pixel electrode side of the first metal thin film 27 into the pixel area with a margin sufficient to block light incident on the first metal thin film 27; and a second dummy black matrix 31b connected to the black matrix 31 and extending from an end at the pixel electrode side of the second metal thin

film 35 into the pixel area with a margin sufficient to block light incident on the second metal thin film 35.

In accordance with the exemplary embodiment of the invention of independent claim 11 and as shown in the exemplary illustration of Figures 4-5, a method of fabricating a liquid crystal display device comprising the steps of forming a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33; forming a switching device 32 including a metal thin film 27 at an intersection between the gate line 34 and the data line 33, wherein the switching device 32 is a thin film transistor at the intersection between the gate line 34 and the data line 33 for driving the pixel electrode 30; and wherein the metal thin film 27 of the switching device 32 is a drain electrode connected to the pixel electrode 30; and forming a light-shielding member 31 for blocking light incident on the metal thin film 27 to overlap with the switching device 32, the light-shielding member 31 extending from an end at the pixel electrode side of a metal thin film 27 of the switching device 32 into the pixel area, the light shielding member 31 covering and extending past all sides of the metal thin film 27 with a margin sufficient to block the light incident on the metal thin film 27 .

In accordance with the exemplary embodiment of the invention of independent claim 15 and as shown in the exemplary illustration of Figures 4 and 6, a method of fabricating a liquid crystal display device comprises the steps of forming a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33; forming a charging device 39 including a first metal thin film 35 on the gate line 34, wherein the first metal thin film 35 recited in independent claim 15 is an upper electrode over the gate line 34 and a dielectric layer; and forming a light-shielding member 31 for blocking light incident on the metal thin film 35 to overlap the metal thin film 35, the light-shielding member 31 extending from an end at the pixel electrode side of the first metal

thin film 35 into the pixel area with a margin sufficient to block the light incident on the metal thin film 35.

In accordance with the exemplary embodiment of the invention of independent claim 19 and as shown in the exemplary illustration of Figures 4-6, a method of fabricating a liquid crystal display device comprises the steps of forming a pixel electrode 30 at a pixel area between a gate line 34 and a data line 33 on a rear substrate 21; forming a thin film transistor 32 including a first metal thin film 27 at an intersection between the gate line 34 and the data line 33 on the rear substrate 21, wherein the metal thin film 27 of the thin film transistor 32 is a drain electrode connected to the pixel electrode 30; forming a storage capacitor 39 including a second metal thin film 35 on the rear substrate 21 and overlapping the gate line, wherein the second metal thin film 35 is an upper electrode over the gate line 34 and a dielectric layer; forming a black matrix 31 on a front substrate 22 opposed to the rear substrate 21 at a boundary portion between pixel areas; forming a first dummy black matrix 31a extending from an end at the pixel electrode side of the first metal thin film 27 into the pixel area on the front substrate 31 with a margin sufficient to block light incident on the first metal thin film 27; and forming a second dummy black matrix 31b extending from an end at the pixel electrode side of the second metal thin film 35 into the pixel area on the front substrate 22 with a margin sufficient to block light incident on the second thin film 35.

6. Grounds of Rejection to be Reviewed on Appeal

Claims 1-3, 5-7, 9, 11-13, 15-17 and 19 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Applicant admitted prior art (AAPA) in view of USPN 6,297,862 (*Murade*).

Claim 21 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over AAPA and *Murade* as applied to claims 1-3, 5-7, 9, 11-13, 15-17 and 19 above, and further in view of USPN 6,266,117 (*Yanagawa et al.*).

7. Argument

Appellants respectfully assert that the rejections under 35 U.S.C. § 103 are improper and should be reversed. In particular, Appellants maintain the positions expressed in the Response filed February 3, 2005 and the Amendment in RCE filed September 30, 2004, and provide the following arguments.

A. Independent Claims 1, 9, 11, and 19

With respect to independent claim 1, Appellants respectfully assert that the applied art does not teach or suggest a combination including a light shielding member that covers and extends "past all sides of a metal thin film of a switching device with a margin sufficient to block light incident on the metal thin film." (Emphasis added.) As further recited in claim 1, the switching device is a "thin film transistor," and the metal thin film is a "drain electrode." The Final Office Action, at page 4, concedes that AAPA does not disclose this feature. As a result, the Examiner further relies on *Murade* to remedy this deficiency by asserting that the teachings of *Murade* would motivate one of ordinary skill in the art to modify the structure of AAPA to include this feature, and therefore, achieve the claimed invention. Appellants respectfully disagree. Appellants respectfully assert that the rejection lacks a suggestion or motivation to modify AAPA with the teachings of *Murade* to achieve the claimed invention as required by MPEP §§ 2143 and 2143.01.

Appellants respectfully assert that nothing in *Murade* suggests that the **metal** thin film of the **drain electrode** of the thin film transistor should be covered by the light shielding layer "with a margin sufficient to block light incident on the metal thin film," as recited in independent claim 1. In the Final Office Action dated April 7, 2005, the Examiner alleges that *Murade* would have motivated one of ordinary skill in the art to modify the structure of AAPA by stating that "Murade indicates (col. 9, lines 58-67) that such black matrix (6) as shown in Fig. 2 covering (overlapping and extending) the TFT including the drain electrode and storage capacitance and the side portion of the pixel electrode would present a display of high quality images free from image degrading effect such as cross talk." (Emphasis in original.) However, after reviewing col. 9, lines 58-67, Appellants respectfully assert that this portion of *Murade* never discusses the drain region 1b of *Murade*. Instead, contrary to the Examiner's assertions, this portion of *Murade* only discusses the channel region 1c and LDD regions 1d/1e, both of which are formed of semiconductor materials.

Thus, Appellants respectfully assert that *Murade* does not provide any suggestion that the metal thin film of the drain electrode of the switching device or the thin film transistor should be covered by the light shielding layer "with a margin sufficient to block light incident on the metal thin film," as recited in independent claim 1. As noted above, the teachings of *Murade* concern shielding the **semiconductor channel region and LDD regions** of the TFT from incident light, not the **metal drain electrode** of the TFT. Thus, according to the teachings of *Murade*, if there is some light shielding structure that covers the channel region, then no additional shielding of light by the black matrix would be needed. Here, Appellants respectfully note that light readily affects the electrical conductivity properties of a semiconductor material, thereby leading to undesired leakage current. As a result, light incident on a semiconductor channel region and

LDD region should be prevented to minimize leakage current – which is the concern of *Murade*. In contrast, light would not readily affect the electrical conductivity properties of a metal. Therefore, *Murade* only teaches covering the channel region and the LDD regions.

As a result, the teachings of *Murade* would not lead one of ordinary skill in the art to modify the structure of Applicant admitted prior art (AAPA) shown in FIG. 2 by extending the light shielding member 11 to achieve the claimed invention. Specifically, the channel region of the transistor of AAPA shown in FIG. 2 is already covered by the light shielding layer 11. Moreover, the drain electrode 7 of AAPA shown in FIG.2 is made of metal. Thus, Appellants respectfully assert that *Murade* does not provide any suggestion or motivation to extend the light shielding member of the alleged AAPA into the pixel area with a margin sufficient to block light incident on the metal thin film of the drain electrode of the thin film transistor, as recited in independent claim 1.

MPEP § 2143.01 instructs that "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP § 2143.01 also instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desireablility of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)." (Emphasis in original.) Thus, Appellants respectfully assert that the rejection of independent claim 1 is improper and should be reversed. Moreover, Appellants respectfully assert that independent claims 9, 11, and 19 recite similar features, and therefore, the rejection of independent claims 9, 11, and 19 are also improper and should be reversed.

B. Independent Claims 5, 9, 15, and 19

With respect to independent claim 5, Applicants respectfully assert that the applied art does not teach or suggest a combination including "a light-shielding member overlapping a charging device and extending . . . into a pixel area with a margin sufficient to block light incident on a metal thin film" of the charging device. (Emphasis added.) Independent claim 5 further recites that the charging device is a "storage capacitor" and that the metal thin film serves as an "upper electrode" of the storage capacitor. The Final Office Action, at page 4, concedes that AAPA does not disclose this feature. As a result, the Examiner further relies on *Murade* to remedy this deficiency by asserting that the teachings of *Murade* would motivate one of ordinary skill in the art to modify the structure of AAPA to include this feature, and therefore, achieve the claimed invention. Appellants respectfully disagree. Appellants respectfully assert that the rejection lacks a suggestion or motivation to modify AAPA with the teachings of *Murade* to achieve the claimed invention as required by MPEP §§ 2143 and 2143.01.

First, Appellants respectfully assert that there is no **metal** film in the storage capacitor disclosed in *Murade*. *Murade* simply teaches that a **non-metallic** capacitance line 16 (formed of a polysilicon film doped to make the material conductive) must be shielded from light (col. 16, lines 65-66; col. 17, lines 31-31) to prevent adverse effects due to incident light, thereby necessitating the black matrix on the opposite substrate. Second, Appellants respectfully note it is not sufficient for *Murade* to disclose that the black matrix 6 covers the upper electrode of the storage capacitor in *Murade*, but there must be a proper motivation or suggestion in the prior art to modify the structure shown in FIG. 3 of AAPA to achieve the claimed invention by extending the light shielding member into the pixel area with a margin sufficient to block light incident on

the **metal** upper electrode of the charging device or the storage capacitor, as recited in independent claim 5.

Appellants respectfully assert that *Murade* does not provide any motivation or suggestion to extend the light shielding layer to cover the storage capacitor when the upper electrode of the storage capacitor is already made of metal. In a manner similar to that described above with respect to independent claim 1, light readily affects the electrical conductivity properties of a doped polysilicon material, thereby leading to adverse effects. Therefore, the light incident on a doped polysilicon conductive line 16, as used by *Murade*, should be blocked. In contrast, light would not readily affect the electrical conductivity properties of a metal. As a result, *Murade* should only be interpreted to teach at most shielding a structure formed of a doped polysilicon material. Moreover, Appellants respectfully assert that *Murade* actually suggests that when such a **metal** storage capacitor electrode is present, there is no need to have a light shielding layer over it. For example, col. 4, lines 43-51 of *Murade* reads:

> According to the substrate for the liquid crystal device, the scan line is made at least of a metal film or a metal alloy film which makes it possible for the scan line to also act as a light shielding film. Because through this arrangement it is possible for the scan line as well as the data line to act as a light shielding film, placement of a black matrix on the opposite substrate can be safely omitted, by forming all the sides surrounding the pixel electrode so as to overlap with the data lines and the scan lines.

Similar descriptions are also found at col. 2, lines 6-9; col. 14, line 63-col. 15, line 5; col. 16, lines 33-38. Therefore, Applicants respectfully assert that *Murade* does not provide a proper motivation for one of ordinary skill in the art to modify the teaching of the alleged AAPA with respect to the charging device (or storage capacitor) to extend the light shielding member into the

pixel area with a margin sufficient to block light incident on the **metal** upper electrode of the charging device or the storage capacitor, as recited in independent claim 5.

MPEP § 2143.01 instructs that "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. MPEP § 2143.01 also instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desireablility of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)." (Emphasis in original.) Thus, Appellants respectfully assert that the rejection of independent claim 5 is improper and should be reversed. Moreover, Appellants respectfully assert that independent claims 9, 15, and 19 recite similar features, and therefore, the rejection of independent claims 9, 15, and 19 are also improper and should be reversed.

C. Dependent Claims

Appellants respectfully assert that dependent claims 2-3, 6-7, 12-13, 16-17, and 20 are allowable at least because of their respective dependencies from independent claims 1, 5, 9, 11, 15, and 19, and the reasons set forth above. Thus, the rejection of dependent claims 2-3, 6-7, 12-13, 16-17, and 20 are improper and should be reversed.

# # # # #

In view of the foregoing, Appellants respectfully requests the reversal of the Examiner's rejection and allowance of the pending claims. If there are any other fees due in connection with the filing of this Appellants' Brief, please charge the fees to our Deposit Account No. 50-0310.

If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account No. 50-0310.

Respectfully submitted,
MORGAN LEWIS & BOCKIUS LLP

Dated: October 7, 2005

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8. Claims Appendix

Subsequent to entry of the Amendment under 37 C.F.R. § 1.116, the claims read as follows:

Claim 1 (Previously Presented): A liquid crystal display device comprising:

a pixel electrode at a pixel area between a gate line and a data line;

a switching device at an intersection between the gate line and the data line, the switching device comprising a light-shielding member overlapping the switching device and extending from an end at the pixel electrode side of a metal thin film provided within the switching device into the pixel area, the light shielding member covering and extending past all sides of the metal thin film with a margin sufficient to block light incident on the metal thin film, wherein the switching device is a thin film transistor at the intersection between the gate line and the data line for driving the pixel electrode, and wherein the metal thin film of the switching device is a drain electrode connected to the pixel electrode.

Claim 2 (Original): The liquid crystal display device of claim 1, wherein the light-shielding member is at a front substrate opposed to a rear substrate, the rear substrate including the switching device and the pixel electrode.

Claim 3 (Original): The liquid crystal display device of claim 2, wherein the light-shielding member is a black matrix.

Claim 4 (Canceled)

Claim 5 (Previously Presented): A liquid crystal display device comprising:

a pixel electrode at a pixel area between a gate line and a data line;

a charging device on the gate line, the charging device comprising a metal thin film, wherein the charging device is a storage capacitor including: an upper electrode formed with the gate line; and a dielectric layer between the upper electrode and the gate line, wherein the metal thin film serves as the upper electrode;

a light-shielding member overlapping the charging device and extending from an end at the pixel electrode side of the metal thin film into the pixel area with a margin sufficient to block light incident on the metal thin film.

Claim 6 (Original): The liquid crystal display device of claim 5, wherein the light-shielding member is formed at a front substrate opposed to a rear substrate that includes the charging device and the pixel electrode.

Claim 7 (Original): The liquid crystal display device of claim 6, wherein the light-shielding member is a black matrix.

Claim 8 (Canceled)

Claim 9 (Previously Presented): A liquid crystal display device comprising:

a pixel electrode at a pixel area between a gate line and a data line;

a thin film transistor at an intersection between the gate line and the data line and including a first metal thin film, wherein the first metal thin film is a drain electrode connected to the pixel electrode;

a storage capacitor on the gate line and including a second metal thin film, wherein the second metal thin film is an upper electrode over the gate line and a dielectric layer;

a black matrix at a boundary portion between pixel areas;

a first dummy black matrix connected to the black matrix and extending from an end at the pixel electrode side of the first metal thin film into the pixel area with a margin sufficient to block light incident on the first metal thin film; and

a second dummy black matrix connected to the black matrix and extending from an end at the pixel electrode side of the second metal thin film into the pixel area with a margin sufficient to block light incident on the second metal thin film.

Claim 10 (Canceled)

Claim 11 (Previously Presented): A method of fabricating a liquid crystal display device comprising the steps of:

forming a pixel electrode at a pixel area between a gate line and a data line;

forming a switching device including a metal thin film at an intersection between the gate line and the data line, wherein the switching device is a thin film transistor at the intersection

between the gate line and the data line for driving the pixel electrode; and wherein the metal thin film of the switching device is a drain electrode connected to the pixel electrode; and

forming a light-shielding member for blocking light incident on the metal thin film to overlap with the switching device, the light-shielding member extending from an end at the pixel electrode side of a metal thin film of the switching device into the pixel area, the light shielding member covering and extending past all sides of the metal thin film with a margin sufficient to block the light incident on the metal thin film.

Claim 12 (Original): The method of claim 11, wherein the switching device and the pixel electrode are formed on a rear substrate; and

wherein the light-shielding member is formed on a front substrate opposed to the rear substrate, with a liquid crystal layer therebetween.

Claim 13 (Original): The method of claim 12, wherein the light-shielding member is a black matrix.

Claim 14 (Canceled)

Claim 15 (Concurrently Amended): A method of fabricating a liquid crystal display device comprising the steps of:

forming a pixel electrode at a pixel area between a gate line and a data line;

forming a charging device including a metal thin film on the gate line, wherein the metal thin film is an upper electrode over the gate line and a dielectric layer; and

forming a light-shielding member for blocking light incident on the metal thin film to overlap the metal thin film, the light-shielding member extending from an end at the pixel electrode side of the metal thin film into the pixel area with a margin sufficient to block the light incident on the metal thin film.

Claim 16 (Original): The method of claim 15, wherein the charging device and the pixel electrode are formed at a rear substrate; and

wherein the light-shielding member is formed at a front substrate opposed to the rear substrate with a liquid crystal layer therebetween.

Claim 17 (Original): The method of claim 16, wherein the light-shielding member is a black matrix.

Claim 18 (Canceled)

Claim 19 (Concurrently Amended): A method of fabricating a liquid crystal display device comprising the steps of:

forming a pixel electrode at a pixel area between a gate line and a data line on a rear substrate;

forming a thin film transistor including a first metal thin film at an intersection between the gate line and the data line on the rear substrate, wherein the first metal thin film of the thin film transistor is a drain electrode connected to the pixel electrode;

forming a storage capacitor including a second metal thin film on the rear substrate and overlapping the gate line, wherein the second metal thin film is an upper electrode over the gate line and a dielectric layer;

forming a black matrix on a front substrate opposed to the rear substrate at a boundary portion between pixel areas;

forming a first dummy black matrix extending from an end at the pixel electrode side of the first metal thin film into the pixel area on the front substrate with a margin sufficient to block light incident on the first metal thin film; and

forming a second dummy black matrix extending from an end at the pixel electrode side of the second metal thin film into the pixel area on the front substrate with a margin sufficient to block light incident on the second thin film.

Claim 20 (Canceled)

Claim 21 (Previously Presented): The liquid crystal display device according to claim 1, wherein the light-shielding member is formed with an organic material containing a black pigment.

9. Evidence Appendix

No information is appended under this section.

10. Related Proceedings Appendix

No information is appended under this section.